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Variations in Socioeconomic Characteristics, Farming Assets and Livelihood Systems of Leyte Rural Households

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ABSTRACT

This paper presents data from a survey of rural households in four rural communities in Leyte Province, the Philippines. Households in extreme poverty were found in each of the communities; on average more than half the households have cash incomes below the poverty threshold. The situation is particularly severe in one community, where cash incomes are less than half the poverty threshold, land ownership is highly concentrated, few households can supply the majority of their own food, and education levels and housing quality are low. The other three communities all face challenges to their development, but their situation appears to be relatively stable in comparison, possibly due to the outcomes of agricultural infrastructure development and access to land provided through community forestry programs.

Keywords: community survey, socio-economic characteristics, food self-sufficiency, extreme poverty, poverty threshold, Gini coefficient, agrarian reform.

INTRODUCTION

It is well recognised that households vary considerably in their social and cultural values as well as their socioeconomic characteristics in terms of the human, social and natural assets at their disposal to support their livelihoods. These variations mean that there are substantial differences in the effects of public programs designed to address rural poverty and improve natural resource management. This paper explores the variations in socioeconomic characteristics between and within rural communities in Leyte Province, the Philippines. The objective of the research was to investigate whether there are substantial differences in socio-economic circumstances of the

households in each of the communities and the relative degree of variations in household circumstances within each of the communities. This information will assist in the design and delivery of targeted rural development activities.

The next section presents background to the study in the form of a review of literature on the topic of poverty and rural development issues in the Philippines. The methods used to obtain and analyse data are then described. The results of a survey of households in four rural communities in Leyte Province are next presented. The final section summarises the findings and presents a series of questions that could be addressed in future research projects.

BACKGROUND

The distribution of income and access to land in the Philippines is, like other developing countries, known to be highly skewed. Relatively few households have large incomes and control over or access to land resources. In Region 8, which includes Leyte Province, it is estimated that 27% of urban households and 50% of rural households are below the poverty threshold (Table 1). The poverty threshold for rural areas in the year 2000 was PhP10,287 per capita per year (NSCB, 2003), i.e. approximately US\$200.

Table 1. Average annual income and poverty incidence in Region 8 and Leyte Province

Income or poverty measure	Region 8	Leyte
Average annual family income (2000) (PhP) ^a	91,520	106,567
Annual per capita poverty thresholds (2000) (PhP)	10,783	
Urban (PhP)	12,011	
Rural (PhP)	10,287	
Poverty incidence of families (2000) (%)	43.6	
Urban (%)	27.1	
Rural (%)	50.0	

Source: NSCB (2003).

a. US\$1 = PhP50 approximately.

The Philippines has fallen from having the third highest GDP per capita in south-east Asia in the 1950s to one of the poorest countries in the region, due to slow growth, a lack of industrial development and extreme inequality in the distribution of wealth (Cramb, 2000). Poverty threshold estimates by Balisacan (2001), based on expenditure rather than income, indicate that the four provinces on the islands of Samar and Biliran adjacent to Leyte Island are among the poorest 10 in the Philippines, but the two provinces (Leyte and Southern Leyte) on Leyte Island are not

in these 10¹. Thus poverty is prevalent throughout much of Region 8 which includes Leyte Province, Southern Leyte and the provinces in Samar. Further, there is a higher poverty incidence in rural households than in urban households (NSCB, 2003). Analysis of the factors determining poverty by Balisacan (1997) revealed that low levels of human capital, inaccessibility of land, lack of infrastructure, and unfavourable policy environments are the main correlates of rural poverty.

Opportunities for rural households in the Philippines to reduce their dependency on farming as the primary source of their livelihood are limited and have failed to expand in recent years. Although the industrial sector of the economy has grown to the extent that it accounted for 33% of the GNP in 1994, this sector accounted for only 15% of employment. On the other hand, the agricultural sector made up 22% of GNP in 1990, and still accounted for 46% of employment in 1994 (Asian Development Bank, 1996). The agricultural sector proportion of the GNP dropped to 37% in 2003, largely due to expansion of the services sector (NSCB, 2003). The opportunities to expand the industrial sector of the economy are presently diminishing through competition with countries that have very low wage levels, including Vietnam and China (Asian Development Bank, 1996). Employment in the industrial sector grew minimally to 16% of total employment, with employment in service industries accounting for 47% of total employment, in 2003 (NSCB, 2003).

Agricultural land is the main asset available to secure the livelihoods of the majority of rural households, there being few opportunities for earning non-farming income. The quality of this land varies from terraced and irrigated plots that are suited to growing the staple crop of rice, to steeply sloping land that is suited to growing coconut palms and tree crops. Annual crops can only be grown on the steep lands for short periods and with rapid soil loss. Although rural households remain far more likely to have income levels below the poverty threshold than those in urban areas, those households with access to higher quality agricultural land are better placed to secure their livelihood. The adoption rate of improved agricultural practices has, like industrialisation, varied greatly between and within countries in south-east Asia.

The industrialisation of agriculture has led to changes in the agricultural sector, with the promotion and adoption of agricultural technologies dramatically increasing the productivity of parts of the agricultural sector in the Philippines (Otsuka *et al.*, 1992). The industrialisation of agriculture improved the livelihoods in some rural areas for those households with secure land titles that can gain access to capital (Angeles-Reyes, 1987). The majority of rural households lack secure land title and capital. Many households that rely on farming for both subsistence and cash income have not adopted modern farming practices, and have lacked competitiveness in selling their produce. More successful households have been able purchase further land, which has increased inequity in the distribution of income and land ownership in

¹ The Philippines is divided into various administrative units including 15 regions and 81 provinces.

the Philippines (Angeles-Reyes, 1987). This concentration of land ownership has increased relative to that established under Spanish rule and has been reinforced through the cronyism prevalent during the Marcos administration (Agoncillo, 1990).

The concentration of ownership of land is particularly acute in highly productive agricultural land (Monte and Lim, 1996, cited in Cramb, 2000). The average area of agricultural holdings doubled in the period from 1948 to 1980 despite population growth (DENR, 1990). The Gini coefficient of per capita income² in the Philippines was 0.49 in 1997 (Reyes, 2000). The Gini coefficient fell slowly over the period 1961 to 1988 from 0.47 to 0.45, but has subsequently increased, reflecting growing income inequality. In 1994 the Gini coefficient for Leyte province was 0.52, which was higher than the national average at 0.45 (Collas-Monsod, 1998). The concentration of land ownership has increased the pressure on people to seek new land for agriculture in the publicly controlled uplands (Ganapin, 1986; Angeles-Reyes, 1987; Cruz *et al.*, 1988; Balisacan, 1996; Pulhin, 1998; Cramb, 2000 and Balisacan and Pernia, 2002).

Approximately one third of Leyte province is 'uplands' and classified by the government as being 'forestland' officially owned by the government. Due to the migration to upland areas, landlessness is lower than official statistics on land ownership suggest because approximately half of the area that is classified officially as public forestland is in fact cleared farm land (De los Angeles, 2000). An informal but nevertheless operative *de facto* system of land ownership and trading exists on these areas (Cramb, 2000). Although the distribution of land tends to be more equitable in upland than lowland areas, within upland communities a new class of tenanted farmers has been formed and the sharp division in wealth evident in the lowlands is being replicated in upland areas (Cruz *et al.*, 1988).

An agrarian reform program has been operating in the Philippines since 1972 in an attempt to provide greater access to land for rural households and reform tenancy arrangements. The agrarian reform program was expanded in 1988 but has made slow progress, with considerable opposition from wealthy landowners in the government and civil society (Saulo-Adriano, 1991; Llanto and Dingcong, 1991; Cramb, 2000; Stevenson *et al.*, 2003). The program has so far concentrated on publicly-owned land, with the estates of privately-owned land more difficult to redistribute. Various methods are employed by landholders with large areas of farmland to avoid being affected by agrarian reform, including use of private militia and a sometimes corrupt legal system. For example, cases have occurred in Leyte where farmers were jailed for harvesting coconuts on land for which they had been granted official land certificates under the agrarian reform program (Oliveros, 1997). The size of the population and concentration of land ownership is so extreme in many areas that there is unlikely to be sufficient land to supply all the households in need.

² The Gini coefficient measures the equality of income distribution in a population. A Gini coefficient of zero indicates perfectly equal income distribution and a coefficient of one represents absolute inequality.

METHODOLOGY OF THE SURVEY OF HOUSEHOLDS LIVELIHOOD SOURCES AND FORESTRY ATTITUDES AND PRACTICES IN LEYTE PROVINCE

An extensive literature review was carried out of previous studies of and theories about social and economic factors affecting small-scale and community forestry programs in the Philippines, the development of typologies to assist natural resource management world-wide, and the social and political history of the Philippines.

A combination of qualitative and quantitative techniques was used to collect and analyse data about the livelihood practices of households in four provinces in Leyte Province, namely content analysis, correlation analysis, analysis of variance, principal components analysis and cluster analysis (following Hair *et al.*, 1998). Topics investigated included households livelihood sources, attitudes to forestry activities and community organisations, and present and intended tree management behaviour (Emtage, 2004). Primary data collection activities included community meetings, two series of focus group discussions, and structured interviews of 50 households from each of four rural communities. During the household interviews, data were collected about the demographic characteristics of household members, sources of livelihood (in particular farming activities), attitudes to various potential reasons for and constraints to tree planting and management on the land currently managed, and present and intended tree planting and management activities on land currently managed.

Responses to the household survey were analysed through a series of statistical tests to assess the relationships between social and economic factors and tree planting and management attitudes and behaviour, as reported in Emtage (2004). This paper concentrates on the analysis of the similarities and differences between the socio-economic characteristics of Leyte households, both within and between rural communities.

FINDINGS OF THE HOUSEHOLD SURVEY

The household survey confirmed that there is a high degree of variation in wealth and well-being in Leyte households, both between and within rural communities. Comparison of survey data with education, income and age statistics for the population of rural households in Leyte Province reported by NSCB (2003) suggest that the sample is reasonably representative of the rural population of the province (Emtage, 2004).

The age and family structure of the households includes extended families, nuclear and single-parent family structures, plus some elderly households. On average there are five members per household across all communities, with slightly higher numbers per household in Tigbao and Poting Bato relative to the other communities (Table 2). These communities have slightly more young adults and elderly people relative to the other communities.

Table 2. Average number of people in each household age class in the participating communities

Community	Below 12	12 to 20	20 to 35	35 to 50	50 to 65	over 65	Mean total
Conalum	1.1	1.6	1.6	1.4	1.4	1.1	4.9
Poting Bato	1.6	2.3	1.4	1.5	1.5	1.6	5.2
Rizal II	1.9	1.7	1.4	1.6	1.5	1.5	4.6
Tigbao	2.0	1.9	1.6	1.5	1.3	1.5	5.2
Average	1.6	1.9	1.5	1.5	1.4	1.4	5.0

As a measure of the human capital available to households, survey participants were asked to indicate the level of formal education completed or under completion by each of the household members. Approximately 30% of households had a highest education level of elementary schooling, 55% had a member with at least high school education and 16% had a member with college or postgraduate education (Table 3).

Table 3. Proportion of households with various categories of highest education in the household in the participating communities

Community	Elementary	High school	College or postgraduate
Conalum (%)	16	61	24
Poting Bato (%)	49	39	12
Rizal II (%)	26	62	12
Tigbao (%)	20	62	18
Average (%)	28	56	16

Some differences between the communities stand out in terms of formal educational levels. Half the households in Poting Bato have members whose highest level of formal education is elementary level, approximately twice the rate of the other communities. On the other hand, households in both Conalum and Tigbao have higher proportions of people with college and post-graduate education.

Respondents nominated a main occupation for each person in the household (Table 4). The most common occupations were farming and house-keeping, followed by labouring. There were too few responses for analysis of differences between the communities with the number of categories used. In Poting Bato, there appears to be a relatively low proportion of high school students and high proportion of labourers, possibly due to the proximity of industrial processing plants nearby. There are lower

number of sari sari stores in Poting Bato and Tigbao, possibly because of their location in upland areas remote from main transport routes.

Table 4. Relative frequencies main occupation types of household members in the four communities^a

Occupation	Conalum (%)	Poting Bato (%)	Rizal II (%)	Tigbao (%)	Average (%)
Farmer	31	45	30	42	37
House-keeping	21	22	25	22	23
Student – high school	23	11	21	20	19
Labourer	10	18	11	10	12
Sari sari operator	8	3	8	2	5
Student – college	4	0	4	3	3
Fisher	2	0	1	0	1
Multi-cab driver	0	0	1	2	1
Put put driver	0	1	1	0	0

a. A put-put is a tricycle available for hire to carry goods or people; a multicab is a small utility vehicle licensed to carry people within and between towns; a sari sari store is a small grocery store found in residential neighbourhoods.

Respondents were also asked to list the ‘other’ occupations undertaken by members of the households. As reported in Table 5, farming and fishing activities dominated these responses, followed by trade-related occupations, small business operation and labouring.

One-way ANOVA tests revealed differences between the communities in terms of the average gross yearly income of responding households (d.f. = 3, $F = 2.724$, $p = 0.045$). Statistical tests (multiple comparison of means, Bonferroni method) revealed that households in Poting Bato have lower average gross yearly income than households in the other communities. Income variability within communities as well as between them is evidenced by the size of the mean-centred coefficient of variation of income levels of the households in the communities and for all respondents (Table 6).

Table 5. 'Other' occupations undertaken by members of households in the participating communities

Occupation	Conalum (%)	Poting Bato (%)	Rizal II (%)	Tigbao (%)
Farming/fishing	64	49	59	59
Tradesperson or small business	25	27	20	11
Labourer	10	18	14	21
Community leader	2	5	7	8
Total	100	100	100	100

Table 6. Average household gross yearly income in the participating communities

Community	N	Mean (PhP)	Median (PhP)	Mean centred coefficient of variation (%)
Conalum	52	58,457	42,380	94
Poting Bato	51	32,883	21,400	96
Rizal II	50	57,331	41,110	96
Tigbao	50	57,403	34,585	117
Average	203	51,495	36,400	106

The median per capita annual incomes were similar for Conalum and Tigbao, at approximately from PhP7,500. They were highest in Rizal II at PhP9,000, while the median per capita income for Poting Bato was much lower, at about PhP4,300, revealing a greater depth of poverty of households in that community (Table 7). Again, the size of the coefficient of variation indicates that there is substantial variation in per capita income within each of the communities.

Table 7. Average income per capita in the participating communities

Community	N	Mean income (PhP)	Proportion of households below regional poverty threshold	Minimum income (PhP)	Maximum income (PhP)	Median income (PhP)	Mean centred coefficient of variation (%)
Conalum	52	19,053	61.5	914	143,000	7,723	153
Poting Bato	51	8,179	78.4	0	45,733	4,380	121
Rizal II	50	14,764	54.0	0	64,100	9,158	96
Tigbao	50	15,784	58.0	796	219,770	7,099	197
Average	203	14,459	61.3	0	219,770	7,091	160

Responding households were asked to indicate the sources of their income as well as the gross level of income from each source (Table 8). On average respondents derived approximately 40% of their income from farming (as well as fishing in the case of some Conalum residents). Respondents from Tigbao reported higher proportions of their income from farming (49%) than the other communities (which averaged approximately 40%), although this difference is not significant at the 5% level.

Table 8. Average and median levels of income per year per household from various sources in participating communities

Income source	Community	N	Mean income (PhP)	Median income (PhP)	Mean centred coefficient of variation (%)
Farming – total cash income (PhP)	Conalum	51	21,092	13,500	95
	Poting Bato	52	12,659	9,000	92
	Rizal II	50	14,372	10,500	88
	Tigbao	50	22,966	17,889	63
	All respondents	181	17,607	13,900	88
Livestock income (PhP)	Conalum	28	4,504	2,200	179
	Poting Bato	20	5,770	4,400	112
	Rizal II	40	1,664	0	308
	Tigbao	30	2,372	1,500	158
	All respondents	118	3,794	1,500.00	158
Remittance amount received average per year (PhP)	Conalum	38	13,520	5,000	168
	Poting Bato	39	2,071	0	118
	Rizal II	36	4,100	0	183
	Tigbao	30	16,917	6,000	130
	All respondents	143	7,708	500.00	220
Share of income from farming or fishing (%)	Conalum	52	40.0	28	-
	Poting Bato	50	39.5	31	-
	Rizal II	49	40.0	27	-
	Tigbao	50	51.9	49	-
	All respondents	201	42.8	35	-

Many of the households in the communities receive money from family members working outside the community (Table 9), though significant differences were observed between communities in terms of the proportion of households receiving remittances (d.f. = 3, $\chi^2 = 32.538$, $p = 0.000$), and the average amount received (Table 8). Those in Poting Bato receive substantially less income from remittances than those in the other communities (Bonferroni multiple comparison of means, $p < 0.005$), and the mean amount received as remittances by households in Conalum is also greater

than that received by households in Rizal II. Almost two thirds of households in Conalum receive remittances compared to just 12% of households in Poting Bato. There are significant differences in total income from farming and the average total amount of remittances received by the households. Households in Tigbao have higher total farming incomes than those in Poting Bato (Bonferroni multiple comparison of means, $p = 0.013$).

Table 9. Income and landownership characteristics of the participating communities

Community	Proportion of households receiving remittances	Gini coefficient of cash income	Proportion of households that own some farm land
Conalum	65	0.42	67
Poting Bato	12	0.44	31
Rizal II	34	0.44	58
Tigbao	46	0.45	72
All communities	39	0.46	57

The variation in per capita income within communities was examined by calculating Gini coefficients. The Gini coefficient of cash incomes for the survey communities ranges from 0.42 to 0.45, which is closer to the national average than the average for Leyte Province (Table 9).

The average area of farming land controlled by the responding households is approximately 3 ha (Table 10). Households own approximately 1.4 ha of this land, an average 0.2 ha of which is suitable for some irrigated rice growing, and rent or lease the rest. All of the communities have high variation in the area of land managed and owned by the household. The one exception where the coefficient of variance is below 100% is the case of the total size of land managed by households in Tigbao.

The mean area of land managed by households in the communities is consistently higher than the median, indicating that the distribution of land area managed is negatively skewed (Table 10). On average, the households own approximately 40% of the land they farm (Table 11). The mean proportion of farming land owned differs significantly between communities (d.f. = 3, $F = 6.647$, $p < 0.0001$), with those in Poting Bato owning considerably less of the land they farm than those in the other communities surveyed (Bonferroni multiple comparison, $p < 0.02$). The number of households that own some portion of the area they manage differs significantly between communities (d.f. = 3, $\chi^2 = 20.546$, $p = 0.000$, Tables 10 and 11). Households in Poting Bato are the least likely, and those in Tigbao are most likely, to own at least some of the land they manage³.

³ Because many households have no official titles of land ownership, this question relied on self-assessment of land ownership.

Table 10. Mean size of various types of landholdings in the participating communities

Land type	Community	N	Mean area (ha)	Median area (ha)	Coefficient of variation (%)
Size of all land controlled by the household (ha)	Conalum	52	2.36	1.38	118
	Poting bato	45	2.18	1.00	137
	Rizal II	49	4.71	3.00	148
	Tigbao	50	2.38	2.25	78
	All respondents	196	2.91		145
Own land size per household (ha)	Conalum	52	1.35	0.50	191
	Poting Bato	51	0.61	0.00	232
	Rizal II	50	2.40	0.75	240
	Tigbao	50	1.42	1.00	128
	All respondents	203	1.44		234
Rice land managed, area per household (ha)	Conalum	52	0.35	0.00	181
	Poting Bato	51	0.52	0.00	253
	Rizal II	50	0.64	0.00	179
	Tigbao	50	0.88	0.50	146
	All respondents	203	0.60		189

Differences were detected in farming activities and tenure patterns between communities. As shown in Table 10, the mean size of land managed by households differs significantly, with households in Rizal II managing larger areas than households in Poting Bato and Conalum (Bonferroni multiple comparison of means, $p < 0.010$), and households in Rizal II owning larger areas of land than those in Conalum ($p = 0.010$) (Table 12).

Table 11. Proportion of total farming land managed that is owned by the household in the participating communities

Community	N	Mean per household (%)	Mean centred coefficient of variation (%)
Conalum	51	47	89
Poting Bato	51	21	178
Rizal II	50	48	97
Tigbao	49	57	74
All respondents	201	43	103

The land ownership patterns described above are reflected in the proportion of the respondents from the various communities that are actively cropping some land and the types of cropping they undertake (Table 13). There are too few respondents to undertake a valid χ^2 test for association. If the 'Rice only' and the 'Rice plus coconuts

and/or vegetables' categories of Table 13 are combined, the proportions of the respondents from each community in various cropping classes are as shown in Table 14. There are significant differences between the types of cropping activities undertaken in the communities (d.f. = 12, χ^2 statistic = 59.388, $p = 0.000$).

Table 12. ANOVA results for differences between communities in the mean area of land of three categories managed by households

Variable	Source of variation	Sum of squares	df	Mean square	F	Sig.
Land size	Between groups	3.283	3	1.094	5.115	.002
	Within groups	40.654	190	.214		
	Total	43.937	193			
Own land size	Between groups	2.293	3	.764	4.204	.007
	Within groups	19.638	108	.182		
	Total	21.931	111			
Size of land suitable for rice growing	Between groups	7.658	3	2.553	2.014	.113
	Within groups	252.212	199	1.267		
	Total	259.870	202			

Table 13. Types of cropping activities undertaken by households in the participating communities

Cropping type	Conalum (%)	Poting Bato (%)	Rizal II (%)	Tigbao (%)	Average (%)
Rice plus coconuts and/or vegetables	40	27	24	74	42
Coconuts and vegetables	21	20	27	8	19
Coconuts only	25	6	27	2	15
Vegetables only	10	24	8	4	11
Rice only	4	8	12	8	8
None	0	16	2	4	5
Total	100	100	100	100	100

It appears that at least half of the respondent households have access to some rice-growing land, with households in Tigbao more likely to have rice-growing land than those in other communities. Respondents from Poting Bato are more likely to have no cropping land at all than those from other communities. The households in Conalum and Rizal II are more likely to have only coconuts as a crop, while in Poting Bato nearly one quarter of respondents have only vegetable crops.

Table 14. Proportion of respondents of various communities undertaking various types of cropping

Community	None	Coconuts only	Coconuts and vegetables	Rice and coconuts and or vegetables	Vegetables only
Conalum (%)	0	25	21	44	10
Poting Bato (%)	16	6	20	35	24
Rizal II (%)	2	27	27	37	8
Tigbao (%)	4	2	8	82	4
Average (%)	5	15	19	50	11

Differences in the area of land owned and rented by households in the various communities are also reflected in differences in numbers of farmland parcels used by households (Table 15). An ANOVA reveals significant differences (d.f. = 3, $F = 17.308$, $p = 0.000$), with multiple comparisons revealing that households in Tigbao and Conalum are likely to control a greater number of farmland parcels than those in Poting Bato and Rizal II, and with Tigbao households having a greater number of farming parcels per household than any of the other communities (Table 15).

Table 15. Mean number of farming parcels used per household in the participating communities

Community	N	Mean	Coefficient of variation (%)
Conalum	52	2.10	47
Poting Bato	51	1.51	55
Rizal II	50	1.40	46
Tigbao	50	2.54	43
Average	203	1.89	53

The Gini coefficient for the distribution of all land in the Philippines was 0.57 in the year 2000 (NSCB, 2003). The coefficient varies between types of land and between regions, and typically is higher in the Visayas than other regions of the Philippines. The Gini coefficient for area of farming land managed by households by community range from 0.42 to 0.45 (Emtage, 2004), which is closer to the national average than the average for Leyte Province (NSCB, 2003). The Gini coefficients of the size of land that is owned by the households and the total size of land controlled or managed by the households in the communities confirm that control of land resources within the communities is characterised by inequitable distribution, particularly in terms of land ownership and the control of rice-growing land (Table 16).

Table 16. Gini coefficients for equality in the distribution of area of land owned and managed in the participating communities

Community	Land owned by household	All land owned or managed by household	Land suitable for growing rice
Conalum	0.70	0.57	0.76
Puting bato	0.78	0.54	0.77
Rizal II	0.67	0.52	0.76
Tigbao	0.65	0.48	0.61

Land is distributed most equitably in Tigbao, and most inequitably in Poting Bato. It is probable that the landholders with the largest areas of land in the communities live outside the community in large metropolitan areas. Because these households were not included in the survey, it is likely that the Gini coefficients of the size of the land managed by households are underestimates of the inequality of the distribution of land resources in the communities.

The generally concentrated patterns of land ownership were thus confirmed in the communities surveyed, where the coefficient is higher for land owned by the household as opposed to land which is leased or simply managed, and higher for rice land than for land suited to growing other crops.

Another measure of the livelihood or well-being of households is the proportion of food requirements that they are able to produce themselves. Respondents' estimates of the proportion of staple foods (rice and or maize) they produce themselves are reported in Table 17, and estimated proportions of the household total food requirements they produce themselves are reported in Table 18. Respondents were asked to nominate one of four percentage ranges rather than give a point estimate.

Table 17. Proportion of staple food needs grown by the household by percentage of respondents in each community

Community	Fraction of staple food needs grown by the household (%)			
	0 - 25%	26 - 50%	51 - 75%	76 - 100%
Conalum (%)	44	10	21	25
Poting Bato (%)	43	22	18	18
Rizal II (%)	70	8	12	10
Tigbao (%)	26	34	22	18
All respondents (%)	46	18	18	18

Differences were found between communities in terms of the proportion of staple food produced by households (d.f. = 9, $\chi^2 = 27.844$, $p = 0.001$), and in terms of the proportion of total food requirements produced by the households. Households in

Tigbao and Conalum reported that they are able to produce a higher proportion of their staple and total food needs than households in Rizal II and Poting Bato.

Table 18: Fraction of households in each community who grow various proportions of total their total food needs

Community	Fraction of total food needs grown by the household (%)			
	0 – 25%	26 – 50%	51 – 75%	76 – 100%
Conalum (%)	38	23	27	12
Poting Bato (%)	53	25	18	4
Rizal II (%)	66	24	6	4
Tigbao (%)	42	18	22	18
All respondents (%)	50	23	18	9

The survey examined the types of materials used in household construction, with material classed as ‘light’ (usually bamboo, with grass or palm thatching), ‘mixed’ (commonly wood and or concrete with some light materials), and ‘concrete’ (where the majority of the house walls are made from concrete). Significant differences in construction materials used were found between communities (d.f. = 6, $F = 33.928$, $p = 0.000$). In the case of Conalum, half the households surveyed have houses that were constructed with concrete, cf. Poting Bato and Rizal II where half the sample households have houses constructed with light materials (Table 19).

Table 19. Percent of respondents from each community whose house is constructed with various types of materials

Community	House construction materials		
	Light materials	Mixed materials	Concrete
Conalum (%)	21	29	50
Poting bato (%)	53	41	6
Rizal II (%)	50	26	24
Tigbao (%)	36	46	18
All respondents (%)	40	35	25

DISCUSSION

The literature on poverty and development in the Philippines suggests that there would be substantial variations in the characteristics of households within and between communities. All of the four communities surveyed had substantial rates of poverty, ranging from 54% to 78% of households, and exceeding the official rates of poverty in rural areas published by the NSCB (2003). Two of the communities stand

out in terms of their lack of well-being as measured by their cash incomes, dwelling construction materials and ability to supply their own food requirements. In the community of Poting Bato, the majority of residents are in a precarious position of having very low cash incomes as well as poor access to land. The consequence is seen partly in terms of the materials used to construct their houses, with more than half the houses being made from light materials only. The depth of poverty is particularly severe in Poting Bato, with the median per capita income being less than half that specified as the official poverty threshold. The residents of Rizal II are, on average, slightly better off in terms of their cash income, primarily because of their proximity to the provincial capital of Tacloban. In terms of their access to land for farming, households in Rizal II are slightly worse off than the residents of Poting ; however, 70% of Rizal II households grow less than 25% of their staple food requirements compared to 44% of households from Poting Bato. These results serve to illustrate that while poverty is a common concern for rural communities throughout Leyte Province, there are differences in the underlying livelihood constraints between the communities. There is substantial variation within each of the communities, as evidenced by the coefficients of variation of mean cash income and farm land area within the communities and the Gini coefficients for these data.

The differences in the socioeconomic circumstances of the residents of the various communities can be attributed in part to community land type and topography, as well as location (particularly proximity to the coast, large towns and major roads). The differences are also attributable to the land ownership patterns in the communities, and the infrastructure for agriculture. It appears that programs of agrarian reform, community forestry and agricultural development can to some extent address the difficulties of poverty and isolation in parts of Leyte Province. For example, although both Tigbao and Poting Bato are located in the mountainous or 'upland' area and have poor (unsealed) road access, the households in Tigbao are better off, both financially and in terms of their level of food self-sufficiency. This is probably due in part to the implementation of an irrigation development program that ensures that the majority of households have access to farming plots that are reliably watered in Tigbao. In Poting Bato, residents report that the springs in the area have dried up over the past 20 years. Another explanatory factor is that households in Tigbao were able to gain access to what was officially forestland, while in Poting Bato this has not been the case despite loss of forest cover. In Poting Bato the community forestry group were only given access to a relatively small land parcel and fire destroyed many of their plantings. Land ownership around Poting Bato is dominated by one landholder who has been able to have their land reclassified to 'industrial use' and thereby avoid the agrarian reform process. In Tigbao, greater access to land has meant that although the households are relatively isolated and have the greatest reliance on farming income of all the communities, their income levels are not significantly below those of households in Conalum and Rizal II because wholesalers visit Tigbao to buy excess crop produce.

The proportion of land used by households that is owned by the household is lower in Poting Bato than in the other communities, particularly Tigbao. In Poting Bato, a number of households have no access to farming land at all, and many others have access to land only suitable for vegetable cropping. The lack of capital and poor roads means that even though the municipal centre of Isabel is reasonably close, and some of the biggest manufacturing industries in Leyte are located there, the majority of households in Poting Bato do not benefit from the presence of these industries. It was found during the household survey that those who do have employment in the phosphate and copper processing industries are employed on a casual basis. On average they work for only 3-4 months a year, enough time to dissuade them from carrying on farming but not enough to substantially improve their financial situation. It is apparent that Poting Bato lost its native forest resources earlier than the other communities. The depressed economic situation is also illustrated by the fact that housing in Poting Bato is constructed from the least permanent materials, the number of people per household is relatively high, education participation is low and households receive the lowest levels of financial remittances from other family members of all the communities. There was a high level of tension evident within the community, as reflected by the number of respondents who nominated the need for improved community cooperation as the main development priority of the community (Emtage, 2004), difficulties in carrying out the survey and the relatively high level of activity of insurgency groups in the area (Cedamon and Emtage, 2005).

Both Conalum and Rizal II are located on the coastal plain of Leyte and are now accessed by sealed national highways. The close proximity of mountainous areas to these communities has provided a number of opportunities. These areas still have some degraded native forest, which were probably retained due to the difficulty of working on steep slopes and have been under the protection of the local peoples' organisations since about 1990. On average, households in Rizal II and Conalum are better off in terms of the gross yearly income than those from Poting Bato. In Rizal II and Conalum, community forestry programs have enabled households to gain access to some farming land, though not land suitable for rice growing. Households in Conalum have access to a greater number of farming plots than those in Rizal II and Poting Bato, although the plot sizes are small compared to those in Tigbao and Rizal II. The higher incomes in Rizal II appear to be related in part to the proximity of Tacloban, the regional capital, just 45 minutes by public transport from the community, which offers employment and marketing opportunities for households. The coastal location in Conalum allows many households to engage in fishing to supplement their incomes.

CONCLUDING COMMENTS

The results presented in this paper highlight the differences between the communities in terms of their access to resources, variations in the livelihood systems practiced by households and the development issues facing the communities, and provide an indication of the degree of variation in the socioeconomic position of households within the communities. In summary, each of the communities is in a unique position and the households in each face different challenges to support their livelihood, but there is also a great deal of variation within each of the communities. Control of land resources and size of cash incomes vary greatly between households within each of the communities, as do the education levels and access to non-farm sources of livelihood. Those households which receive remittances from urban areas or overseas or have a small business are better off financially than the households that are heavily reliant on income from farming activities. The relatively close proximity of the copper and phosphate processing industries to Poting Bato has not translated into improved well-being for households in this community. Education levels in the community are low as is participation in secondary schooling, preventing migration to urban centres to earn higher income to remit to the household. Because the low-skilled employment in the processing industries is on a casual basis it has not provided households with regular income to build their assets or income levels, while the lack of access to land has prevented them from developing their farming systems. The findings from the research reported in this paper suggest that the development of non-agricultural employment opportunities are not sufficient on their own to improve the well-being of rural households and that greater efforts are needed to extend the agrarian reform program to private landholdings that continue to dominate some areas of Leyte.

There are considerable differences in the well-being status of households in the four communities included in this study. The differences within the communities are such that there are greater similarities between households from different communities than between households in the same communities. For those interested in supporting rural development policies and programs, the question is how to vary these programs and their delivery to maximise their effectiveness. A typology of households based on their livelihood systems can be used to further explore and aid interpretation of this diversity (Emtage, in prep.). The typology will be used to investigate whether there are identifiable patterns of assets used to provide the livelihood supports of households and assist the targeting of measures to improve well-being of rural households in Leyte Province.

REFERENCES

- ANGELES-REYES, E. 1987. *The Structure of Rural Household Income and its Implications on Rural Poverty in Bicol, the Philippines*. Philippine Institute for Development Studies, Makati.
- AGONCILLO, T.A. 1990. *History of the Filipino People*. Garotech Publishing, Quezon City.
- ASIAN DEVELOPMENT BANK (ADB). 1996. *Key Indicators of Developing Asian and Pacific Countries*. Oxford University Press, Oxford.
- BALISACAN, A.M. 1996. Philippines. In: *Rural Poverty in Developing Asia. Vol. 2: Indonesia, Republic of Korea, Philippines and Thailand* (M.G. Quibria, ed.). Asian Development Bank, Manila. pp. 409 – 585.
- BALISACAN, A.M. 1997. *Poverty and Economic Inequity in the Philippines*. Paper prepared for the Asian Development Bank, Manila.
- BALISACAN, A.M. 2001. *Poverty Comparison in the Philippines: Is What We Know about the Poor Robust*. Asia and Pacific Forum on Poverty: Reforming Policies and Institutions for Poverty Reduction, Manila.
- BALISACAN, A.M. and E.M. PERNIA. 2002. *Probing Beneath Cross-national Averages: Poverty Inequity and Growth in the Philippines*. ERD Working Paper No. 7. Asian Development Bank, Manila.
- CEDAMON, E.D. and N.F. EMTAGE. 2005. Conducting surveys on forestry attitudes and practices in Leyte communities, Philippines: Experiences and lessons learnt. *Small-scale Forest Economics, Management and Policy*. 4(1): 69-84, 2005.
- COLLAS-MONSOD, S. 1998. The war against poverty, a status report. In: *The Philippines: New directions in domestic policy and foreign relations* (Timberman, D.G., ed.). Asia Society. http://www.ciaonet.org/book/ass01/ass01_c.html. Accessed 5 September 2005.
- CRAMB, R.A. (ed.) 2000. *Soil Conservation Technologies for Smallholder Farming Systems in the Philippine Uplands*. ACIAR, Canberra.
- CRUZ, C.J., ZOSA-FERANIL, I. and C.L. GOCE. 1988. Population pressure and migration: Implications for upland development in the Philippines. *Journal of Philippine Development*. 15(1): 15-46.
- DE LOS ANGELES, M.S. 2000. *An Assessment of Natural Resources Management in the Philippines*. A paper prepared for the World Bank Resident Mission of the Philippines. Pasig City.
- DENR. 1990. *Master Plan for Forestry*. Quezon City.
- EMTAGE, N.F. 2004. *An Investigation of the Social and Economic Factors Affecting the Development of Small-scale Forestry by Rural Households in Leyte Province, the Philippines*, PhD thesis, School of Natural and Rural Systems Management, The University of Queensland, Gatton, Australia.
- EMTAGE, N.F. (in prep.). A preliminary typology of rural households in the Philippines based on characteristics of their livelihood systems.

- GANAPIN, D.J. 1986. Forest resources and timber trade in Philippines. In proceedings of the conference on *Forest Resources in the Third World*. Saharbat Alam, Kuala Lumpur. pp. 54-70.
- HAIR, J.F., ANDERSON, R.E., TATHAM, R.L and W.C. BLACK. 1998. *Multivariate Data Analysis with Readings*. Prentice Hall, Englewood Cliffs, New Jersey.
- LLANTO, G. and C. DINCONG. 1991. *Impact of Agrarian Reform on Landowners: A Review of Literature and Conceptual Framework*. Philippines Institute for Development Studies, Manila, Pub. No. 91-14: pp. 28.
- NSCB (National Statistics Coordination Board of the Philippines). 2003. <http://www.census.gov.ph/census2000/c2khighlightsfinal.html>. Accessed 24 June 2003.
- OLIVEROS, T. 1997. Impact of new world trade regime on peasant women in the Philippines. *Forum News* (Vol.10, No. 2, July 1997) produced by the Asia-Pacific Forum on Women, Law and Development. <http://www.twinside.org.sg/title/regime-cn.htm>. Accessed 10 September 2003.
- OTSUKA, K., CORDOVA, V. and C.C. DAVID. 1992. Green revolution, land reform and income distribution in the Philippines. *Economic Development and Cultural Change*, 40(4): 714-741.
- PULHIN, J.M. 1998. Community-based forest management: issues and challenges. Paper presented to the 6th UNAC Annual Consultative Conference, Metro Manila.
- REYES, C.M. 2000. *Poverty profile of the Philippines*. In proceedings of the 4th Meeting of the MIMAP (Micro Impacts of Macroeconomic Adjustment Policies Project) Research Network, Palawan. Policy and Development Foundation Inc. Makati, Metro Manila.
- SAULO-ADRIANO, L. 1991. *A General Assessment of the Comprehensive Agrarian Reform Program*. Philippines Institute for Development Studies, Manila. Pub. No. 91-13: pp. 96.
- STEVENSON J.R., IRZ, X.T., PRIMAVERA, J.H. and G. SEPULVEDA. 2003. *Coastal Aquaculture Systems in the Philippines: Social Equity, Property Rights and Disregarded Duties*. Beijer International Institute of Environmental Economics, The Royal Swedish Academy of Sciences. <http://www.beijer.kva.se/conference2003/Stevenson.pdf>. Accessed 6 August 2003.